CRYSTAL ICE CO., INC.
New Bedford, MA

ROOM EXHAUST VENTILATION & RELIEF VENT DISCHARGE LOCATIONS

July 5, 2012

The following table presents an evaluation of five areas of concern regarding the discharge location of room exhaust vents and one relief vent, as identified by USEPA, Region I. Note that the proposed corrective actions are preliminary and subject to further review during a focused process hazard analysis (PHA) review that will be conducted at the New Bedford facility on August 14, 2012. The PHA team will include representatives from Crystal Ice, including system operators, and American Refrigeration Company. The PHA will be facilitated by Neil Mulvey, Principal, NPM Environmental & Safety, Inc. Mr. Mulvey offers extensive experienced in PHA facilitation and process safety.

The system was installed in accordance with the Code of Massachusetts Regulations 522 CMR 9.00 Refrigeration & Air Conditioning. Section 9.90 of that Code includes a **Safety Code for Mechanical Refrigeration.** Paragraph 9.90, 1(a) states that *"In accordance with the provisions of M.G.L. c. 146, §2, the Board of Boiler Rules herewith adopts by reference the 1997 ANSI/ASHRAE Safety Code. The application of this Code is intended to assure that safe design, construction, installation, operation, and inspection of every refrigeration system employing a fluid which normally is vaporized and liquefied in its refrigeration cycle."*

ANSI/ASHRAE-15 includes the following requirements:

8.13 – Refrigerating Machinery Room, General Requirements
- 8.13.4 – Mechanical ventilation
  - *"The discharge of the air shall be to the outdoors in such a manner as not to cause a nuisance or danger."*

9.7 – Pressure Relief Protection
- 9.7.8 – Pressure Relief Devices and Fusible Plugs
  - *" ..... shall discharge to the atmosphere at a location not less than 15-ft. above the adjoining ground level and not less than 20-ft. from any window, ventilation opening, or exit in any building, The discharge shall be terminated in a manner that will prevent the discharged refrigerant from being sprayed directly on personnel in the vicinity and foreign material or debris from entering the discharge piping."*

#	AREA OF CONCERN	DESCRIPTION OF EXHAUST LOCATION	EVALUATION vs. ASHRAE-15	PROPOSED CORRECTIVE ACTION
1	Compressor room emergency exhaust ventilation	Outside S wall of building. Est. 20-ft. below roof. Est. 20-ft. above ground level. Est. 4-ft. above compressor room window.	Not compliant with distance to window in compressor room. The exhaust location is an estimated 20-ft. below the building roof, and may present a hazard to unauthorized persons on the roof (i.e., potential 'nuisance or danger').	Secure window in compressor room near exhaust vent so that it cannot be opened. Develop 'roof access permit' to ensure that only authorized personnel may be on roof and only when informed of potential hazards.
2	Recirculator room exhaust ventilation	Outside S wall of building, Est. 5-ft. above loading dock platform. Est. 10-ft. below condenser platform.	Not compliant since this discharge location may present a 'nuisance or danger' to persons on the loading dock.	Crystal Ice is currently evaluating alternatives for addressing this discharge location. The PHA review session will assist in the evaluation and selection of a final solution.
3	Penthouse room exhaust ventilation	Outside S wall of penthouse. Est. 5-ft. below roof. Est. 40-ft. above ground level. Est. 5-ft. above man-door into penthouse.	The exhaust location is an estimated 5-ft. below the building roof, and may present a hazard to unauthorized persons on the roof (i.e., potential 'nuisance or danger'). The exhaust location is an estimated 5-ft. above the man-door into the penthouse.	Develop 'roof access permit' to ensure that only authorized personnel may be on roof and only when informed of potential hazards. The penthouse is an unmanned work area with only periodic entrance by authorized refrigeration system operators. No other persons are permitted in this space. There is therefore no 'nuisance or danger' to other workers. Alternatively, Crystal Ice is considering relocating

				this discharge location to the E wall of the penthouse, away from the man-door and at least 20-ft. above grade.
4	Former compressor room exhaust ventilation	Outside E wall of building. Est. 5-ft. below roof. Est. 20-ft. above ground level.	The exhaust location is an estimated 5-ft. below the building roof, and may present a hazard to unauthorized persons on the roof (i.e., potential 'nuisance or danger').	Develop 'roof access permit' to ensure that only authorized personnel may be on roof and only when informed of potential hazards.
5	Compressor room relief vent (RV)	Outside S wall of building. "Goose-neck" vent directed downward. Est. 20-ft. below roof. Est. 15-ft. above condenser platform.	"Goose-neck" vent in downward oriented position may impact persons on condenser platform. The exhaust location is an estimated 20-ft. below the building roof, and may present a hazard to unauthorized persons on the roof (i.e., potential 'nuisance or danger').	Remove 'goose-neck' and orient vent to straight vertical discharge; install rain-cap to prevent rain/snow from entering vent. Develop 'roof access permit' to ensure that only authorized personnel may be on roof and only when informed of potential hazards.

NOTE:
The above evaluation was prepared by:

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